

1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 83x^2 + 165x + 100}{6x^2 + 19x + 15}$$

- A. Holes at $x = -1.5$ and $x = -1.667$ with no vertical asymptotes.
 - B. Vertical Asymptotes of $x = -1.5$ and $x = -1.667$ with no holes.
 - C. Vertical Asymptote of $x = -1.5$ and hole at $x = -1.667$
 - D. Vertical Asymptote of $x = 2.0$ and hole at $x = -1.667$
 - E. Vertical Asymptotes of $x = -1.5$ and $x = -1.25$ with a hole at $x = -1.667$
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 41x^2 - 40x + 48}{12x^2 - x - 6}$$

- A. Holes at $x = -0.667$ and $x = 0.75$ with no vertical asymptotes.
 - B. Vertical Asymptotes of $x = -0.667$ and $x = 0.75$ with no holes.
 - C. Vertical Asymptotes of $x = -0.667$ and $x = -1.333$ with a hole at $x = 0.75$
 - D. Vertical Asymptote of $x = -0.667$ and hole at $x = 0.75$
 - E. Vertical Asymptote of $x = 1.0$ and hole at $x = 0.75$
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3. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 5x^2 - 33x - 18}{6x^2 + x - 12}$$

- A. Vertical Asymptote of $x = 1.333$ and hole at $x = -1.5$
- B. Holes at $x = 1.333$ and $x = -1.5$ with no vertical asymptotes.
- C. Vertical Asymptote of $x = 1.0$ and hole at $x = -1.5$
- D. Vertical Asymptotes of $x = 1.333$ and $x = -1.5$ with no holes.

- E. Vertical Asymptotes of $x = 1.333$ and $x = -0.667$ with a hole at $x = -1.5$
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4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{4x^3 + 8x^2 - 27x - 45}{8x^2 + 2x - 15}$$

- A. Vertical Asymptotes of $x = 1.25$ and $x = 2.5$ with a hole at $x = -1.5$
- B. Vertical Asymptotes of $x = 1.25$ and $x = -1.5$ with no holes.
- C. Holes at $x = 1.25$ and $x = -1.5$ with no vertical asymptotes.
- D. Vertical Asymptote of $x = 0.5$ and hole at $x = -1.5$
- E. Vertical Asymptote of $x = 1.25$ and hole at $x = -1.5$
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5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 + x^2 - 42x - 45}{3x^2 + 20x + 25}$$

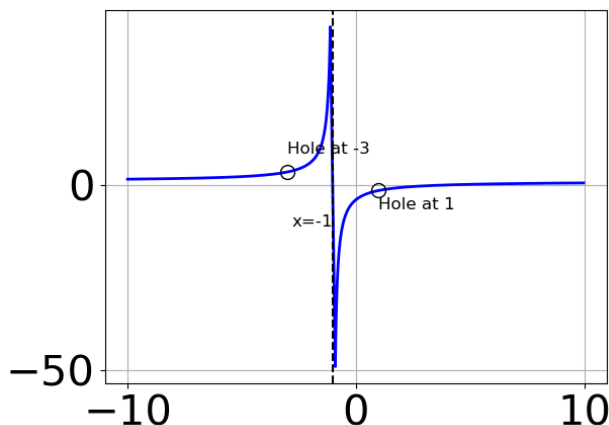
- A. Horizontal Asymptote of $y = -5.0$ and Oblique Asymptote of $y = 2x - 13$
- B. Oblique Asymptote of $y = 2x - 13$.
- C. Horizontal Asymptote at $y = -5.0$
- D. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 13$
- E. Horizontal Asymptote of $y = 2.0$
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6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^2 - 23x + 15}{24x^3 - 134x^2 + 167x - 60}$$

- A. Horizontal Asymptote of $y = 0.250$
 - B. Oblique Asymptote of $y = 4x - 7$.
 - C. Horizontal Asymptote of $y = 0$
 - D. Horizontal Asymptote at $y = 3.000$
 - E. Horizontal Asymptote of $y = 0.250$ and Oblique Asymptote of $y = 4x - 7$
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7. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + 6.0x^2 - 32.0}{x^3 - 3.0x^2 - x + 3.0}$
 - B. $f(x) = \frac{x^3 + 2.0x^2 - 11.0x - 12.0}{x^3 - 3.0x^2 - x + 3.0}$
 - C. $f(x) = \frac{x^3 - 2.0x^2 - 11.0x + 12.0}{x^3 + 3.0x^2 - x - 3.0}$
 - D. $f(x) = \frac{x^3 - 4.0x^2 - 36.0x + 144.0}{x^3 + 3.0x^2 - x - 3.0}$
 - E. None of the above are possible equations for the graph.
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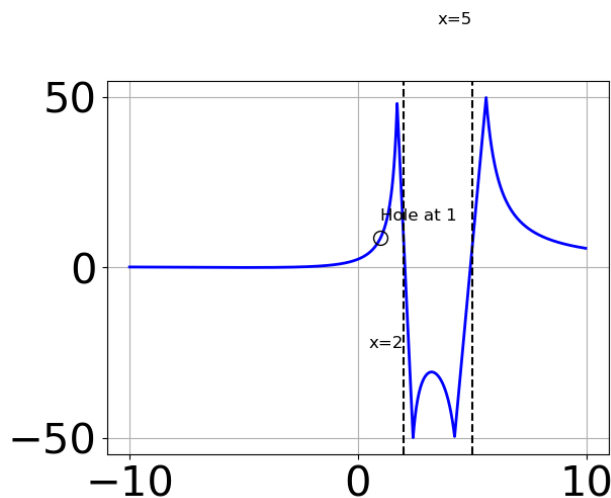
8. Determine the horizontal and/or oblique asymptotes in the rational

function below.

$$f(x) = \frac{6x^2 - 25x - 25}{12x^3 + 40x^2 - 47x - 60}$$

- A. Oblique Asymptote of $y = 2x + 15$.
- B. Horizontal Asymptote of $y = 0$
- C. Horizontal Asymptote at $y = 5.000$
- D. Horizontal Asymptote of $y = 0.500$
- E. Horizontal Asymptote of $y = 0.500$ and Oblique Asymptote of $y = 2x + 15$

9. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 - 9.0x^2 + 14.0x + 24.0}{x^3 + 8.0x^2 + 17.0x + 10.0}$
- B. $f(x) = \frac{x^3 - 12.0x^2 + 44.0x - 48.0}{x^3 + 8.0x^2 + 17.0x + 10.0}$
- C. $f(x) = \frac{x^3 + 15.0x^2 + 74.0x + 120.0}{x^3 - 8.0x^2 + 17.0x - 10.0}$
- D. $f(x) = \frac{x^3 + 9.0x^2 + 14.0x - 24.0}{x^3 - 8.0x^2 + 17.0x - 10.0}$
- E. None of the above are possible equations for the graph.

10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 + 10x^2 - 13x - 15}{4x^2 - 21x + 20}$$

- A. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 2x + 13$
 - B. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x + 13$
 - C. Horizontal Asymptote at $y = 4.0$
 - D. Oblique Asymptote of $y = 2x + 13$.
 - E. Horizontal Asymptote of $y = 2.0$
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